

Gabel  
443010

=> fil reg

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

0.15

0.15

FILE 'REGISTRY' ENTERED AT 13:18:25 ON 12 MAY 2000  
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STRUCTURE FILE UPDATES: 11 MAY 2000 HIGHEST RN 264285-81-6  
DICTIONARY FILE UPDATES: 11 MAY 2000 HIGHEST RN 264285-81-6

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 11, 2000

Please note that search-term pricing does apply when  
conducting SmartSELECT searches.

Structure search limits have been increased. See HELP SLIMIT  
for details.

=> s (nitrogen or hydrogen or helium or argon)/cn

1 NITROGEN/CN

1 HYDROGEN/CN

1 HELIUM/CN

1 ARGON/CN

L1

4 (NITROGEN OR HYDROGEN OR HELIUM OR ARGON)/CN

=> fil medl,caplus,biosis,embase,wpids,ntis,inspec

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

14.70

14.85

FILE 'MEDLINE' ENTERED AT 13:18:48 ON 12 MAY 2000

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=> s (separat? or capillar? column or column chromatograph? or flow channel)  
and (porous or silicon or gas? phase or pressure or differential or variati?  
or change or gradient or induc?)

L2 94159 FILE MEDLINE  
L3 213076 FILE CAPLUS  
L4 93347 FILE BIOSIS  
L5 76638 FILE EMBASE  
L6 159773 FILE WPIDS  
L7 23388 FILE NTIS  
L8 56806 FILE INSPEC

TOTAL FOR ALL FILES

L9 717187 (SEPARAT? OR CAPILLAR? COLUMN OR COLUMN CHROMATOGRAPH? OR FLOW  
CHANNEL) AND (POROUS OR SILICON OR GAS? PHASE OR PRESSURE OR  
DIFFERENTIAL OR VARIATI? OR CHANGE OR GRADIENT OR INDUC?)

=> s l9 and (l1 or nitrogen or hydrogen or helium or argon)

L10 5152 FILE MEDLINE  
L11 19403 FILE CAPLUS  
L12 2660 FILE BIOSIS  
L13 2054 FILE EMBASE  
L14 9118 FILE WPIDS  
'CN' IS NOT A VALID FIELD CODE  
L15 2465 FILE NTIS  
'CN' IS NOT A VALID FIELD CODE  
L16 4708 FILE INSPEC

TOTAL FOR ALL FILES

L17 45560 L9 AND (L1 OR NITROGEN OR HYDROGEN OR HELIUM OR ARGON)

=> s (mobile or stationary)(w)phase and l17

L18 500 FILE MEDLINE  
L19 293 FILE CAPLUS  
L20 90 FILE BIOSIS  
L21 106 FILE EMBASE  
L22 24 FILE WPIDS  
L23 18 FILE NTIS  
L24 13 FILE INSPEC

TOTAL FOR ALL FILES

L25 1044 (MOBILE OR STATIONARY)(W) PHASE AND L17

=> s (captur? or sandwich? or immobil?)2a)(antibod? or antigen? or ligand? or  
partner? or binder?) and l25

MISSING OPERATOR IMMOBIL?)2A

The search profile that was entered contains terms or  
nested terms that are not separated by a logical operator.

=>

=> s (captur? or sandwich? or immobil?)(2a)(antibod? or antigen? or ligand?  
or partner? or binder?) and l25

L26 1 FILE MEDLINE  
L27 0 FILE CAPLUS  
L28 0 FILE BIOSIS  
L29 0 FILE EMBASE

L30 0 FILE WPIDS  
L31 0 FILE NTIS  
L32 0 FILE INSPEC

TOTAL FOR ALL FILES

L33 1 (CAPTUR? OR SANDWICH? OR IMMOBIL?) (2A) (ANTIBOD? OR ANTIGEN? OR  
LIGAND? OR PARTNER? OR BINDER?) AND L25

=> d cbib abs hit

L33 ANSWER 1 OF 1 MEDLINE

1999028405 Document Number: 99028405. Chiral **separation** of  
DL-tryptophan using **porous** membranes containing multilayered  
bovine serum albumin crosslinked with glutaraldehyde. Nakamura M;  
Kiyohara

S; Saito K; Sugita K; Sugo T. (Department of Specialty Materials, Faculty  
of Engineering, Chiba University, Japan. ) JOURNAL OF CHROMATOGRAPHY. A,  
(1998 Sep 25) 822 (1) 53-8. Journal code: BXJ. ISSN: 0021-9673. Pub.  
country: Netherlands. Language: English.

AB Bovine serum albumin (BSA) as a chiral **ligand** was  
**captured** uniformly throughout a **porous** hollow-fiber  
membrane at a level of 160 mg/g by the polymer chains grafted onto the  
membrane. BSA was bound in three layers with an end-on orientation to  
diethylamino groups on the graft chains which expanded from the pore  
surface towards the pore interior due to mutual electrostatic repulsion.  
Subsequently, crosslinking of BSA with a 0.025% (w/w) of glutaraldehyde

in a Tris-HCl buffer (pH 8) for 4 h was effective in stabilizing the amount  
of BSA immobilized at a level of 150 mg/g. A solution of DL-tryptophan in  
a Tris-HCl buffer as a **mobile phase** permeated the  
crosslinked-BSA multilayered membrane and produced a chromatogram with a  
**separation** factor of 12. BSA leakage was not detected in the  
**mobile phases** at various pH values and organic  
modifiers.

TI Chiral **separation** of DL-tryptophan using **porous**  
membranes containing multilayered bovine serum albumin crosslinked with  
glutaraldehyde.

AB Bovine serum albumin (BSA) as a chiral **ligand** was  
**captured** uniformly throughout a **porous** hollow-fiber  
membrane at a level of 160 mg/g by the polymer chains grafted onto the  
membrane. BSA was bound in three layers with an end-on orientation to  
diethylamino groups on the graft chains which expanded from the pore  
surface towards the pore interior due to mutual electrostatic repulsion.  
Subsequently, crosslinking of BSA with a 0.025% (w/w) of glutaraldehyde

in a Tris-HCl buffer (pH 8) for 4 h was effective in stabilizing the amount  
of BSA immobilized at a level of 150 mg/g. A solution of DL-tryptophan in  
a Tris-HCl buffer as a **mobile phase** permeated the  
crosslinked-BSA multilayered membrane and produced a chromatogram with a  
**separation** factor of 12. BSA leakage was not detected in the  
**mobile phases** at various pH values and organic  
modifiers.

CT Check Tags: Animal; Support, Non-U.S. Gov't

Cattle

Chromatography, Ion Exchange

Cross-Linking Reagents

\*Glutaral: AN, analysis

**Hydrogen-Ion Concentration**

Membranes, Artificial

\*Serum Albumin, Bovine: AN, analysis

Stereoisomerism  
\*Tryptophan: IP, isolation & purification

=> s sample and (separat? apparat? or capillar? column?) and silicon and  
(stationar? or mobile) (w)phase

MISSING TERM BEFORE 'AND'

Search expressions cannot begin with operators.

=> s "sample" and (separat? apparat? or capillar? column?) and silicon and  
(stationar? or mobile) (w)phase

L34	0	FILE MEDLINE
L35	8	FILE CAPLUS
L36	0	FILE BIOSIS
L37	2	FILE EMBASE
L38	1	FILE WPIDS
L39	3	FILE NTIS
L40	5	FILE INSPEC

TOTAL FOR ALL FILES

L41	19	"SAMPLE" AND (SEPARAT? APPARAT? OR CAPILLAR? COLUMN?) AND SILICO
		N AND (STATIONAR? OR MOBILE) (W) PHASE

=> s l41 not l33

L42	0	FILE MEDLINE
L43	8	FILE CAPLUS
L44	0	FILE BIOSIS
L45	2	FILE EMBASE
L46	1	FILE WPIDS
L47	3	FILE NTIS
L48	5	FILE INSPEC

TOTAL FOR ALL FILES

L49	19	L41 NOT L33
-----	----	-------------

=> s l49 and (electrode proximat? or chromatograph? or electrophoret? or  
analyte identifica?)

L50	0	FILE MEDLINE
L51	8	FILE CAPLUS
L52	0	FILE BIOSIS
L53	2	FILE EMBASE
L54	1	FILE WPIDS
L55	3	FILE NTIS
L56	5	FILE INSPEC

TOTAL FOR ALL FILES

L57	19	L49 AND (ELECTRODE PROXIMAT? OR CHROMATOGRAPH? OR ELECTROPHORET? OR ANALYTE IDENTIFICA?)
-----	----	------------------------------------------------------------------------------------------------

=> dup rem l57

PROCESSING COMPLETED FOR L57

L58	15	DUP REM L57 (4 DUPLICATES REMOVED)
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=> d 1-15 cbib abs hit;s gilton t?/au,in

L58 ANSWER 1 OF 15 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD

AN 2000-237686 [20] WPIDS

AB WO 200011463 A UPAB: 20000426

NOVELTY - The **capillary column** (10) has a tube structure (12), and a deactivated surface-bonded sol-gel coating (14) on

a

portion of the tube structure forming a **stationary phase** coating on that portion of the tube structure. The deactivated **stationary-phase** sol-gel coating enables separation of analytes while minimizing their adsorption on the sol-gel coated tube structure.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for the preparation of a **capillary column**, comprising providing a tube structure and a sol-gel solution comprising a sol-gel precursor, an organic material with at least one sol-gel active

functional

group, a sol-gel catalyst, a deactivation reagent, and a solvent system. At least a portion of the tube structure is reacted with the sol-gel solution under controlled conditions to produce a surface-bonded sol-gel coating on the portion of the tube structure. The sol-gel solution is expelled from the portion of the tube structure. The coated portion of

the

tube structure is heated under controlled conditions to cause the deactivation reagent to treat with the surface-bonded sol-gel coating to deactivate and to condition the sol-gel coated portion of the tube structure.

USE - In gas **chromatography**, liquid **chromatography**, capillary electrochromatography, supercritical fluid **chromatography** and as pre-concentrators where a compound of interest is present in very small concentrations in a **sample**.

ADVANTAGE - Enables separation of deactivated **stationary phase** sol-gel coating of analytes while minimizing adsorption of analytes on the separation column structure. It simplifies the

methodology

for the preparation of high efficiency gas **chromatography** columns, and offers an opportunity to reduce the column preparation time at least by a factor of ten. Being simple in technical execution, the new technology is very suitable for automation and mass production. The columns provide improved thermal stability due to direct chemical bonding of the **stationary phase** coating to the capillary walls. Good surface deactivation quality is obtained, which is comparable with or improved over that obtained by conventional techniques. It is supported by high efficiency separations obtained for polar compounds including free fatty acids, amines, alcohols, diols, aldehydes and

ketone.

DESCRIPTION OF DRAWING(S) - The drawing shows a schematic cross sectional view of the **capillary column**.

Capillary tube 10

Tube structure 12

Coating 14

Dwg.2/39

TI

**Capillary column** for use in gas **chromatography**, includes a tube structure, and a deactivated surface-bonded sol-gel coating on a portion of the tube structure to form a **stationary phase** coating.

AB

WO 200011463 A UPAB: 20000426

NOVELTY - The **capillary column** (10) has a tube structure (12), and a deactivated surface-bonded sol-gel coating (14) on

a

portion of the tube structure forming a **stationary phase** coating on that portion of the tube structure. The deactivated **stationary-phase** sol-gel coating enables separation of analytes while minimizing their adsorption on the sol-gel coated tube structure.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for the preparation of a **capillary column**, comprising providing a tube structure and a sol-gel solution comprising a sol-gel precursor, an organic material with at least one sol-gel active functional

group, a sol-gel catalyst, a deactivation reagent, and a solvent system. At least a portion of the tube structure is reacted with the sol-gel solution under controlled conditions to produce a surface-bonded sol-gel coating on the portion of the tube structure. The sol-gel solution is expelled from the portion of the tube structure. The coated portion of the

tube structure is heated under controlled conditions to cause the deactivation reagent to treat with the surface-bonded sol-gel coating to deactivate and to condition the sol-gel coated portion of the tube structure.

USE - In gas **chromatography**, liquid **chromatography**, capillary electrochromatography, supercritical fluid **chromatography** and as pre-concentrators where a compound of interest is present in very small concentrations in a **sample**.

ADVANTAGE - Enables separation of deactivated **stationary phase** sol-gel coating of analytes while minimizing adsorption of analytes on the separation column structure. It simplifies the methodology

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DESCRIPTION OF DRAWING(S) - The drawing shows a schematic cross sectional view of the **capillary column**.

Capillary tube 10

Tube structure 12

Coating 14

Dwg.2/39

TECH

UPTX: 20000426

TECHNOLOGY FOCUS - POLYMERS - Preferred Compounds: The residual of the deactivation reagent is polymethylhydrosiloxane, or hexamethyldisilazane. The sol-gel reaction residual includes molecules with hydroxysilane, alkoxy silane functional groups, their combination, polymers or monomers, e.g. polydimethylsiloxane, polymethylphenylsiloxane, polydimethyldiphenylsiloxane, polyethylene glycol, or related polymers, e.g. Carbowax 20M (RTM), polyalkylene glycol, e.g. Ucon (RTM), macrocyclic molecules like cyclodextrins, crown ethers, calixarenes, alkyl moieties, e.g. octadecyl, or octyl.

Preferred Composition: The sol-gel precursor comprises an alkoxy compound.

The organic material comprises monomeric or polymeric material with at least one sol-gel active functional group.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Element: The sol-gel

precursor-forming element is **silicon**, aluminum, titanium or zirconium.

Preferred **Silicon**: The sol-gel catalyst is selected from an acid, a base and a fluoride compound.

Preferred Reagent: The deactivation reagent comprises a material reactive to hydroxyl groups bonded to the sol-gel precursor-forming element or to the tube wall surface.

Preferred Coating: The deactivated surface-bonded sol-gel-coating on the portion of the tube structure is of formula (I).

X = residual of a deactivation reagent;

Y = sol-gel residual of a sol-gel-active organic molecule;

Z = sol-gel precursor-forming element; and

l, m, n, p and q are all at least 0, but are not simultaneously 0.

The dotted lines indicate the continuation of the chemical structure with X, Y, Z, or H in space.

TT TT: **CAPILLARY COLUMN GAS CHROMATOGRAPHY TUBE**  
STRUCTURE DEACTIVATE SURFACE BOND SOL GEL COATING PORTION TUBE  
STRUCTURE FORM **STATIONARY PHASE** COATING.

L58 ANSWER 2 OF 15 CAPLUS COPYRIGHT 2000 ACS

2000:287836 Determination of alkyl alcohol polyoxyethylene ether by high temperature gas **chromatography**. Zhu, Zhi-rong (Shanghai Research Institute of Petrochemical Technology, Shanghai, 201208, Peop. Rep. China). Sepu, 18(2), 138-141 (Chinese) 2000. CODEN: SEPUER. ISSN: 1000-8713. Publisher: Kexue Chubanshe.

AB High temp. GC method has been developed for the sepn. and detn. of alkyl alc. polyoxyethylene ether (AEO). These AEO **samples** were sepd. on high temp. Al-coated fused-silica **capillary column** (0.1 .mu.m bonded Me **silicon stationary phase**, 25 m .times. 0.25 mm i.d.). The components of AEO **sample** were identified by GC/MS. The free alkyl alc. and ethoxymmer distribution of polyoxyethylene of AEO **sample** were detd. by normalization method. The FID responses of typical components of AEO **sample** were detd., and their relative deviations were less than 4.1%. The recoveries of the free alkyl alc. ranged from 96.5% to 98.1%. The relative std. deviations were less than 1.9%. In comparing with previous methods, this method is simple, fast and more reproducible.

TI Determination of alkyl alcohol polyoxyethylene ether by high temperature gas **chromatography**

AB High temp. GC method has been developed for the sepn. and detn. of alkyl alc. polyoxyethylene ether (AEO). These AEO **samples** were sepd. on high temp. Al-coated fused-silica **capillary column** (0.1 .mu.m bonded Me **silicon stationary phase**, 25 m .times. 0.25 mm i.d.). The components of AEO **sample** were identified by GC/MS. The free alkyl alc. and ethoxymmer distribution of polyoxyethylene of AEO **sample** were detd. by normalization method. The FID responses of typical components of AEO **sample** were detd., and their relative deviations were less than 4.1%. The recoveries of the free alkyl alc. ranged from 96.5% to 98.1%. The relative std. deviations were less than 1.9%. In comparing with previous methods, this method is simple, fast and more reproducible.

L58 ANSWER 3 OF 15 CAPLUS COPYRIGHT 2000 ACS

DUPLICATE 1

1998:770584 Document No. 130:115397 Review and summary of a **silicon** micromachined gas **chromatography** system. Kolesar, Edward S., Jr.; Reston, Rocky R. (Department of Engineering, Texas Christian University, Fort Worth, TX, 76129, USA). IEEE Trans. Compon., Packag., Manuf. Technol., Part B, 21(4), 324-328 (English) 1998. CODEN: IMTBE4. ISSN: 1070-9894. Publisher: Institute of Electrical and Electronics Engineers.

AB A review with 13 refs. A miniature gas **chromatog.** (GC) system

- has been designed and fabricated using **silicon** micromachining and integrated circuit (IC) processing techniques. The **silicon** micromachined gas **chromatog.** system (SMGCS) is composed of a miniature **sample** injector that incorporates a 10 .mu.l **sample** loop; a 0.9-m long, rectangular-shaped (300 .mu.m width and 10 .mu.m height) **capillary column** coated with a 0.2-.mu.m thick copper phthalocyanine (CuPc) **stationary-phase**; and a dual-detector scheme based upon a CuPc-coated chemiresistor and a com. available, 125-.mu.m diam. thermal cond. detector
- (TCD) bead. **Silicon** micromachining was employed to fabricate the interface between the **sample** injector and the GC column, the column itself, and the dual-detector cavity. A novel IC thin-film processing technique was developed to sublime the CuPc **stationary-phase** coating on the column walls that were micromachined in the host **silicon** wafer substrate and Pyrex cover plate, which were then electrostatically bonded together. The SMGCS can sep. binary gas mixts. composed of parts-per-million (ppm) concns. of ammonia (NH3) and nitrogen dioxide (NO2) when isothermally operated (55-80 .degree.C). With a helium carrier gas and nitrogen diluent, a 10 .mu.l **sample** vol. contg. ammonia and nitrogen dioxide injected at 40 psi (2.8 .times. 105 Pa) can be sepd. in less than 30 min.
- TI Review and summary of a **silicon** micromachined gas **chromatography** system
- AB A review with 13 refs. A miniature gas **chromatog.** (GC) system has been designed and fabricated using **silicon** micromachining and integrated circuit (IC) processing techniques. The **silicon** micromachined gas **chromatog.** system (SMGCS) is composed of a miniature **sample** injector that incorporates a 10 .mu.l **sample** loop; a 0.9-m long, rectangular-shaped (300 .mu.m width and 10 .mu.m height) **capillary column** coated with a 0.2-.mu.m thick copper phthalocyanine (CuPc) **stationary-phase**; and a dual-detector scheme based upon a CuPc-coated chemiresistor and a com. available, 125-.mu.m diam. thermal cond. detector
- (TCD) bead. **Silicon** micromachining was employed to fabricate the interface between the **sample** injector and the GC column, the column itself, and the dual-detector cavity. A novel IC thin-film processing technique was developed to sublime the CuPc **stationary-phase** coating on the column walls that were micromachined in the host **silicon** wafer substrate and Pyrex cover plate, which were then electrostatically bonded together. The SMGCS can sep. binary gas mixts. composed of parts-per-million (ppm) concns. of ammonia (NH3) and nitrogen dioxide (NO2) when isothermally operated (55-80 .degree.C). With a helium carrier gas and nitrogen diluent, a 10 .mu.l **sample** vol. contg. ammonia and nitrogen dioxide injected at 40 psi (2.8 .times. 105 Pa) can be sepd. in less than 30 min.
- ST review gas **chromatog** micromachined **silicon**
- IT Gas **chromatographs**  
Micromachining  
(**silicon** micromachined gas **chromatog.** system)
- IT 7440-21-3, **Silicon**, uses  
RL: DEV (Device component use); USES (Uses)  
(**silicon** micromachined gas **chromatog.** system)
- IT 147-14-8, Copper phthalocyanine  
RL: NUU (Nonbiological use, unclassified); TEM (Technical or engineered material use); USES (Uses)  
(**stationary phase**; **silicon** micromachined gas **chromatog.** system)



97373211 EMBASE Document No.: 1997373211. Separation of polar compounds by solvating gas **chromatography** with carbon dioxide **mobile phase**. Shen Y.; Lee M.L.. M.L. Lee, Department Chemistry/Biochemistry, Brigham Young University, Provo, UT 84602, United States. Chromatographia 46/11-12 (587-592) 1997.

Refs: 25.

ISSN: 0009-5893. CODEN: CHRGB7. Pub. Country: Germany. Language: English. Summary Language: English.

AB In this study, the separation of polar compounds in solvating gas **chromatography** (SGC) was investigated. **Capillary columns** (250 .mu.m i.d.) packed with deactivated siliceous particles, including SE-54 encapsulated silica particles, diol-bonded silica particles, and polyethylenimine (PEI) coated particles, and nonsiliceous particles of styrene-divinylbenzene were used. Polar compounds that were used as test solutes included ketones, aldehydes, esters, nitro-containing compounds, alcohols, phenols, fatty acids, and amines. It was found that **capillary columns** packed with SE-54 encapsulated particles were suitable for the separation of medium polar compounds, columns packed with diol bonded silica particles could be used for separation of strongly polar compounds such as fatty acids, and columns packed with PEI coated silica particles were suitable for the separation of basic compounds such as alkylamines under SGC conditions. Columns containing the polymeric particles could be used for the separation of medium polar compounds and weak bases, however, low column efficiency was observed. SGC was found to provide better separation

of polar compounds than high pressure gas **chromatography** (HPGC).

A **sample** of a peppermint oil was separated within 8 min under SGC conditions.

TI Separation of polar compounds by solvating gas **chromatography** with carbon dioxide **mobile phase**.

AB In this study, the separation of polar compounds in solvating gas **chromatography** (SGC) was investigated. **Capillary columns** (250 .mu.m i.d.) packed with deactivated siliceous particles, including SE-54 encapsulated silica particles, diol-bonded silica particles, and polyethylenimine (PEI) coated particles, and nonsiliceous particles of styrene-divinylbenzene were used. Polar compounds that were used as test solutes included ketones, aldehydes, esters, nitro-containing compounds, alcohols, phenols, fatty acids, and amines. It was found that **capillary columns** packed with SE-54 encapsulated particles were suitable for the separation of medium polar compounds, columns packed with diol bonded silica particles could be used for separation of strongly polar compounds such as fatty acids, and columns packed with PEI coated silica particles were suitable for the separation of basic compounds such as alkylamines under SGC conditions. Columns containing the polymeric particles could be used for the separation of medium polar compounds and weak bases, however, low column efficiency was observed. SGC was found to provide better separation

of polar compounds than high pressure gas **chromatography** (HPGC).

A **sample** of a peppermint oil was separated within 8 min under SGC conditions.

CT Medical Descriptors:

**\*gas chromatography**

article

coated particle

drug isolation

materials

priority journal

**supercritical fluid chromatography**

Drug Descriptors:

- \*alcohol derivative
- \*aldehyde
- \*ester
- \*fatty acid
- \*ketone
- \*phenol derivative
- \*polyethyleneimine
- \*polymer
- \*silicon dioxide

RN (polyethyleneimine) 74913-72-7; (silicon dioxide) 10279-57-9, 14464-46-1, 14808-60-7, 15468-32-3, 60676-86-0, 7631-86-9

L58 ANSWER 5 OF 15 INSPEC COPYRIGHT 2000 IEE

AN 1998:5794860 INSPEC DN A9803-8280-019; B9802-2575-021

AB A miniature gas **chromatography** (GC) system has been designed and fabricated using **silicon** micromachining and integrated circuit (IC) processing techniques. The **silicon** micromachined gas **chromatography** system (SMGCS) is composed of a miniature **sample** injector that incorporates a 10  $\mu$ l **sample** loop; a 0.9-m long, rectangular-shaped (300  $\mu$ m width and 10  $\mu$ m height) **capillary column** coated with a 0.2-  $\mu$ m thick copper phthalocyanine (CuPc) **stationary-phase**; and a dual-detector scheme based upon a CuPc-coated chemiresistor and a commercially available, 125-  $\mu$ m diameter thermal conductivity detector (TCD) bead. **Silicon** micromachining was employed to fabricate the interface between the **sample** injector and the GC column, the column itself, and the dual-detector cavity. A novel IC thin-film processing technique was developed to sublime the CuPc **stationary-phase** coating on the column walls that were micromachined in the host **silicon** wafer substrate and Pyrex cover plate, which were then electrostatically bonded together. The SMGCS can separate

binary

gas mixtures composed of parts per-million (ppm) concentrations of ammonia

(NH<sub>3</sub>) and nitrogen dioxide (NO<sub>2</sub>) when isothermally operated (55-80 degrees

C). With a helium carrier gas and nitrogen diluent, a 10  $\mu$ l **sample** volume containing ammonia and nitrogen dioxide injected at 40 psi (2.8\*10<sup>5</sup> Pa) can be separated in less than 30 minutes.

TI **Silicon** micromachined gas **chromatography** system.

AB A miniature gas **chromatography** (GC) system has been designed and fabricated using **silicon** micromachining and integrated circuit (IC) processing techniques. The **silicon** micromachined gas **chromatography** system (SMGCS) is composed of a miniature **sample** injector that incorporates a 10  $\mu$ l **sample** loop; a 0.9-m long, rectangular-shaped (300  $\mu$ m width and 10  $\mu$ m height) **capillary column** coated with a 0.2-  $\mu$ m thick copper phthalocyanine (CuPc) **stationary-phase**; and a dual-detector scheme based upon a CuPc-coated chemiresistor and a commercially available, 125-  $\mu$ m diameter thermal conductivity detector (TCD) bead. **Silicon** micromachining was employed to fabricate the interface between the **sample** injector and the GC column, the column itself, and the dual-detector cavity. A novel IC thin-film processing technique was developed to sublime the CuPc **stationary-phase** coating on the column walls that were micromachined in the host **silicon** wafer substrate and Pyrex cover plate, which were then electrostatically bonded together. The SMGCS can separate

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C). With a helium carrier gas and nitrogen diluent, a 10  $\mu$ l sample volume containing ammonia and nitrogen dioxide injected at 40 psi ( $2.8 \times 10^5$  Pa) can be separated in less than 30 minutes.

CT **CHROMATOGRAPHY**; ELEMENTAL SEMICONDUCTORS; MICROMACHINING; SILICON

ST **silicon micromachining**; integrated circuit thin-film processing; **silicon micromachined gas chromatography system**; **sample injector**; **capillary column**; **copper phthalocyanine stationary-phase coating**; dual-detector cavity; thermal conductivity detector; chemiresistor; sublimation; **silicon wafer substrate**; Pyrex cover plate; electrostatic bonding; binary gas mixture; isothermal separation; 55 to 80 C; Si; NH<sub>3</sub>; NO<sub>2</sub>

L58 ANSWER 6 OF 15 EMBASE COPYRIGHT 2000 ELSEVIER SCI. B.V.

97158736 EMBASE Document No.: 1997158736. Fast supercritical fluid **chromatography** using capillaries packed with nonporous particles. Shen Y.; Lee M.L.. Y. Shen, Department of Chemistry/Biochemistry, Brigham Young University, Provo, UT 84602, United States. Chromatographia 45/-(67-77) 1997.

Refs: 24.

ISSN: 0009-5893. CODEN: CHRGB7. Pub. Country: Germany. Language: English. Summary Language: English.

AB Packed columns containing microparticles provide high column efficiency per unit time and strong retention characteristics compared with open tubular columns, and they are favored for fast separations. Nonporous particles eliminate the contribution of solute mass transfer resistance

in the intraparticle void volume characteristic of porous particles, and they should be more suitable for fast separations. In this paper, the

evaluation of nonporous silica particles of sizes ranging from 5 to 25  $\mu$ m in packed **capillary columns** for fast supercritical fluid **chromatography** (SFC) using neat CO<sub>2</sub> is reported. These particles were first deactivated using polymethylhydrosiloxanes and then encapsulated with a methylphenylpolysiloxane **stationary phase**. The retention factors, column efficiencies, column efficiencies per unit

time, separation resolution, and separation resolution per unit time for fast SFC were determined for various length capillaries packed with various sizes of polymer-encapsulated nonporous particles. It was found that 15  $\mu$ m nonporous particles provided the highest column efficiency per unit time and resolution per unit time for fast packed capillary SFC. Under certain conditions, separations were completed in less than 1 min.

Several

thermally labile sialylation reagent **samples** were separated in times less than 5 min.

TI Fast supercritical fluid **chromatography** using capillaries packed with nonporous particles.

AB Packed columns containing microparticles provide high column efficiency per unit time and strong retention characteristics compared with open tubular columns, and they are favored for fast separations. Nonporous particles eliminate the contribution of solute mass transfer resistance

in the intraparticle void volume characteristic of porous particles, and they should be more suitable for fast separations. In this paper, the

evaluation of nonporous silica particles of sizes ranging from 5 to 25  $\mu$ m in packed **capillary columns** for fast supercritical fluid **chromatography** (SFC) using neat CO<sub>2</sub> is reported. These particles were first deactivated using

polymethylhydrosiloxanes and then encapsulated with a methylphenylpolysiloxane **stationary phase**. The retention factors, column efficiencies, column efficiencies per unit time, separation resolution, and separation resolution per unit time for fast SFC were determined for various length capillaries packed with various sizes of polymer-encapsulated nonporous particles. It was found that 15 .mu.m nonporous particles provided the highest column efficiency per unit time and resolution per unit time for fast packed capillary SFC. Under certain conditions, separations were completed in less than 1 min.

Several

thermally labile sialylation reagent **samples** were separated in times less than 5 min.

CT Medical Descriptors:

**\*column chromatography**

\*particle size

**\*supercritical fluid chromatography**

**capillary chromatography**

conference paper

encapsulation

priority journal

thermostability

Drug Descriptors:

**\*silicon dioxide**

carbon dioxide

polymer

polysiloxane

reagent

silane derivative

RN (silicon dioxide) 10279-57-9, 14464-46-1, 14808-60-7, 15468-32-3, 60676-86-0, 7631-86-9; (carbon dioxide) 124-38-9, 58561-67-4

L58 ANSWER 7 OF 15 NTIS COPYRIGHT 2000 NTIS

AN 1997(11):1439 NTIS

AB A miniature gas chromatography (GC) system was designed and fabricated using silicon micromachining and integrated circuit (IC) processing techniques. The silicon micromachined gas chromatography system (SMGCS)

is

composed of a miniature sample injector that incorporates a 10 microliter sample loop; a 0.9 meter long, rectangular shaped (300 micrometer width and 10 micrometer height) capillary column coated with a 0.2 micrometer thick copper phthalocyanine (CuPc) stationary phase; and a dual detector scheme based upon a CuPc-coated chemiresistor and a commercially

available

125 micrometer diameter thermal conductivity detector (TCD) bead. Silicon micromachining was employed to fabricate the interface between the sample injector and the GC column, the column itself, and the dual detector cavity. A novel IC thin-film processing technique was developed to

sublime

the CuPc stationary phase coating on the column walls that were micromachined in the host silicon wafer substrate and Pyrex (r) cover plate, which were then electrostatically bonded together. The SMGCS can separate binary gas mixtures composed of parts-per-million (ppm) concentrations of ammonia (NH3) and nitrogen dioxide (NO2) when isothermally operated (55-80 degrees C). With a helium carrier gas and nitrogen diluent, a 10 microliter sample volume containing ammonia and nitrogen dioxide injected at 40 psi ((2.8 x 10(exp 5)Pa)) can be

separated

in less than 30 minutes.

L58 ANSWER 8 OF 15 CAPLUS COPYRIGHT 2000 ACS

DUPLICATE 2

1996:20317 Document No. 124:95732 **Silicon** micromachined gas **chromatographic** system (SMGCS) for directly separating binary fugitive emissions of ammonia (NH<sub>3</sub>) and nitrogen dioxide (NO<sub>2</sub>). Kolesar, Edward S. Jr.; Reston, Rocky R. (Department of Engineering, Texas Christian University, Fort Worth, TX, 76129, USA). Proc. SPIE-Int. Soc. Opt. Eng., Volume Date 1995, 2642, 110-20 (English) 1995. CODEN: PSISDG. ISSN: 0277-786X.

AB A miniature gas **chromatog.** (GC) system was designed and fabricated using **silicon** micromachining and integrated circuit processing techniques. The **silicon** micromachined gas **chromatog.** system is composed of a miniature **sample** injector that incorporates a 10  $\mu$ L **sample** loop; a 0.9-m long, rectangular-shaped (300  $\mu$ m width and 10  $\mu$ m height) **capillary column** coated with a 0.2- $\mu$ m thick copper phthalocyanine (CuPc) **stationary-phase**; and a dual-detector scheme based upon a CuPc-coated chemiresistor and a com. available, 125- $\mu$ m diam. thermal cond. detector bead. **Silicon** micromachining was employed to fabricate the interface between the **sample** injector and the GC column, the column itself, and the dual-detector cavity.

TI **Silicon** micromachined gas **chromatographic** system (SMGCS) for directly separating binary fugitive emissions of ammonia (NH<sub>3</sub>)

and nitrogen dioxide (NO<sub>2</sub>)

AB A miniature gas **chromatog.** (GC) system was designed and fabricated using **silicon** micromachining and integrated circuit processing techniques. The **silicon** micromachined gas **chromatog.** system is composed of a miniature **sample** injector that incorporates a 10  $\mu$ L **sample** loop; a 0.9-m long, rectangular-shaped (300  $\mu$ m width and 10  $\mu$ m height) **capillary column** coated with a 0.2- $\mu$ m thick copper phthalocyanine (CuPc) **stationary-phase**; and a dual-detector scheme based upon a CuPc-coated chemiresistor and a com. available, 125- $\mu$ m diam. thermal cond. detector bead. **Silicon** micromachining was employed to fabricate the interface between the **sample** injector and the GC column, the column itself, and the dual-detector cavity.

ST ammonia nitrogen dioxide air analysis; **silicon** micromachined gas **chromatog** air analysis

IT Air analysis

Air pollution

(**silicon** micromachined gas **chromatog.** system for directly sepg. binary fugitive emissions of ammonia and nitrogen dioxide)

IT 7664-41-7, Ammonia, analysis 10102-44-0, Nitrogen oxide (NO<sub>2</sub>), analysis  
RL: ANT (Analyte); ANST (Analytical study)

(**silicon** micromachined gas **chromatog.** system for directly sepg. binary fugitive emissions of ammonia and nitrogen dioxide)

L58 ANSWER 9 OF 15 CAPLUS COPYRIGHT 2000 ACS

1995:240515 Document No. 122:95378 **Silicon** micromachined gas **chromatography** system with a thin-film copper phthalocyanine **stationary phase** and its resulting performance. Kolesar,, Edward S. Jr.; Reston, Rocky R. (Texas Christian University, Department of Engineering, Electrical Engineering Laboratories, Fort Worth, TX, 76129-5100, USA). Surf. Coat. Technol., 68-69, 679-85 (English) 1994. CODEN: SCTEEJ. ISSN: 0257-8972.

AB A miniature gas **chromatog.** (GC) system was designed, fabricated and developed using modern **silicon** micromachining and integrated circuit (IC) processing techniques. The micromachined GC system is composed of a miniature **sample** injector that incorporates a 10  $\mu$ L **sample** loop, a rectangular-shaped (width, 300  $\mu$ m;

height, 10  $\mu\text{m}$ ) **capillary column**, with a length of 0.9 m, coated with a copper phthalocyanine (CuPc) **stationary phase** (thickness, 0.2  $\mu\text{m}$ ) and a dual-detector scheme based on a CuPc-coated chemiresistor and a com. available, thermal cond. detector (TCD) bead (diam., 125  $\mu\text{m}$ ). **Silicon** micromachining was employed to fabricate the interface between the **sample** injector and the GC column, the column itself and the dual-detector cavity. A novel IC thin-film processing technique was developed to sublime the CuPc **stationary phase** coating on the column walls that were micromachined in the host **silicon** wafer substrate and the Pyrex.RTM. cover plate, which were then electrostatically bonded together.

The CuPc-coated chemiresistor was designed and fabricated using conventional IC processing techniques. The micromachined GC system can sep. ppm ammonia and nitrogen dioxide concns. when isothermally operated (55-80.degree.). With helium carrier gas and nitrogen diluent, a 10

$\mu\text{L}$

**sample** vol. contg. ammonia and nitrogen dioxide injected at 40 lbf in-2 (2.8  $\times$  105 Pa) can be sepd. in <30 min.

TI **Silicon** micromachined gas **chromatography** system with a thin-film copper phthalocyanine **stationary phase** and its resulting performance

AB A miniature gas **chromatog.** (GC) system was designed, fabricated and developed using modern **silicon** micromachining and integrated circuit (IC) processing techniques. The micromachined GC system is composed of a miniature **sample** injector that incorporates a 10  $\mu\text{L}$  **sample** loop, a rectangular-shaped (width, 300  $\mu\text{m}$ ; height, 10  $\mu\text{m}$ ) **capillary column**, with a length of 0.9 m, coated with a copper phthalocyanine (CuPc) **stationary phase** (thickness, 0.2  $\mu\text{m}$ ) and a dual-detector scheme based on a CuPc-coated chemiresistor and a com. available, thermal cond. detector (TCD) bead (diam., 125  $\mu\text{m}$ ). **Silicon** micromachining was employed to fabricate the interface between the **sample** injector and the GC column, the column itself and the dual-detector cavity. A novel IC thin-film processing technique was developed to sublime the CuPc **stationary phase** coating on the column walls that were micromachined in the host **silicon** wafer substrate and the Pyrex.RTM. cover plate, which were then electrostatically bonded together.

The CuPc-coated chemiresistor was designed and fabricated using conventional IC processing techniques. The micromachined GC system can sep. ppm ammonia and nitrogen dioxide concns. when isothermally operated (55-80.degree.). With helium carrier gas and nitrogen diluent, a 10

$\mu\text{L}$

**sample** vol. contg. ammonia and nitrogen dioxide injected at 40 lbf in-2 (2.8  $\times$  105 Pa) can be sepd. in <30 min.

ST **silicon** micromachined gas **chromatog** system; copper phthalocyanine film phase miniature GC

IT **Chromatographs**, gas  
**Chromatography**, gas

(**silicon** micromachined gas **chromatog.** system with thin-film copper phthalocyanine **stationary phase** for gas anal.)

IT 7664-41-7, Ammonia, analysis 10102-44-0, Nitrogen dioxide, analysis  
RL: ANT (Analyte); ANST (Analytical study)

(**silicon** micromachined gas **chromatog.** system with thin-film copper phthalocyanine **stationary phase** for gas anal.)

IT 147-14-8, Copper phthalocyanine 7440-21-3, **Silicon**, uses  
RL: DEV (Device component use); NUU (Nonbiological use, unclassified);  
USES (Uses)

(silicon micromachined gas chromatog. system with thin-film copper phthalocyanine stationary phase for gas anal.)

- L58 ANSWER 10 OF 15 INSPEC COPYRIGHT 2000 IEE  
AN 1994:4790222 INSPEC DN A9422-8670L-011; B9411-7720-011  
AB A miniature gas **chromatography** (GC) system has been designed, fabricated and developed using modern **silicon** micromachining and VLSI circuit processing techniques. The GC system is composed of a miniature **sample** injector that incorporates a 10  $\mu$ l **sample** loop; a 0.9 m long, rectangular-shaped (300  $\mu$ m width and 10  $\mu$ m height) **capillary column** coated with a 0.2  $\mu$ m thick copper phthalocyanine (CuPc) **stationary phase**: and a dual-detector scheme based upon a CuPc-coated chemiresistor and a commercially available, 125-  $\mu$ m diameter thermal conductivity detector (TCD) bead. **Silicon** micromachining was employed to fabricate the interface between the **sample** injector and the GC system's column, the GC system's column itself, and the dual-detector cavity. A novel integrated circuit thin film processing technique was developed to sublime the CuPc **stationary phase** coating on the GC system's column walls micromachined in the host **silicon** wafer substrate and the Pyrex cover plate which are subsequently electrostatically bonded together. The CuPc-coated chemiresistor was designed and fabricated using conventional VLSI circuit processing techniques. The miniature GC system has demonstrated the capability to directly and completely separate parts-per-million (ppm) ammonia and nitrogen dioxide concentrations when isothermally operated (55-80 degrees C). With a helium carrier gas and nitrogen diluent, a 10  $\mu$ l **sample** volume containing ammonia and nitrogen dioxide injected at 40 psi can be separated in less than 30 minutes.
- TI Miniature gas **chromatography** system realized using conventional VLSI fabrication techniques applied to quantifying toxic environmental pollutants.
- AB A miniature gas **chromatography** (GC) system has been designed, fabricated and developed using modern **silicon** micromachining and VLSI circuit processing techniques. The GC system is composed of a miniature **sample** injector that incorporates a 10  $\mu$ l **sample** loop; a 0.9 m long, rectangular-shaped (300  $\mu$ m width and 10  $\mu$ m height) **capillary column** coated with a 0.2  $\mu$ m thick copper phthalocyanine (CuPc) **stationary phase**: and a dual-detector scheme based upon a CuPc-coated chemiresistor and a commercially available, 125-  $\mu$ m diameter thermal conductivity detector (TCD) bead. **Silicon** micromachining was employed to fabricate the interface between the **sample** injector and the GC system's column, the GC system's column itself, and the dual-detector cavity. A novel integrated circuit thin film processing technique was developed to sublime the CuPc **stationary phase** coating on the GC system's column walls micromachined in the host **silicon** wafer substrate and the Pyrex cover plate which are subsequently electrostatically bonded together. The CuPc-coated chemiresistor was designed and fabricated using conventional VLSI circuit processing techniques. The miniature GC system has demonstrated the capability to directly and completely separate parts-per-million (ppm) ammonia and nitrogen dioxide concentrations when isothermally operated (55-80 degrees C). With a helium carrier gas and nitrogen diluent, a 10  $\mu$ l **sample** volume containing ammonia and nitrogen dioxide injected at 40 psi can be separated in less than 30 minutes.
- CT AIR POLLUTION; AIR POLLUTION DETECTION AND CONTROL; AMMONIA; CHEMICAL VARIABLES MEASUREMENT; **CHROMATOGRAPHY**; ELECTRIC SENSING DEVICES; GAS SENSORS; INTEGRATED CIRCUIT TECHNOLOGY; NITROGEN COMPOUNDS; VLSI
- ST **miniature gas chromatography**; VLSI fabrication; toxic

environmental pollutants; **miniature sample injector**;  
**capillary column**; copper phthalocyanine; dual-detector scheme;  
CuPc-coated chemiresistor; thermal conductivity detector; thin film  
processing; Pyrex cover plate; ammonia; nitrogen dioxide; helium carrier  
gas; nitrogen diluent; 0.9 m; 125  $\mu\text{m}$ ; 55 to 80 C; 30 min; NO<sub>2</sub>; N<sub>2</sub>; NH<sub>3</sub>;  
He; Si

- L58 ANSWER 11 OF 15 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 3  
1995:743095 Document No. 123:305268 **Silicon-micromachined gas chromatography** system used to separate and detect ammonia and nitrogen dioxide. Part I: Design, fabrication, and integration of the gas **chromatography** system. Reston, Rocky R.; Kolesar, Edward S. Jr. (School of Medicine, Uniformed Services University of Health Sciences, Bethesda, MD, 20853, USA). J. Microelectromech. Syst., 3(4), 134-46 (English) 1994. CODEN: JMIYET. ISSN: 1057-7157.
- AB A miniature gas **chromatog.** (GC) system was designed and developed using Si micromachining and integrated circuit (IC) processing techniques. The micromachined gas **chromatog.** (MMGC) system is composed of a miniature **sample injector** incorporating a 10- $\mu\text{m}$ -long **sample loop**; a 0.9-m-long, rectangular-shaped (300  $\mu\text{m}$  width and 10  $\mu\text{m}$  height) **capillary column** coated with a 0.2- $\mu\text{m}$ -thick Cu phthalocyanine (CuPc) **stationary phase**, and a dual-detector scheme based upon a CuPc-coated chemiresistor and a 125- $\mu\text{m}$ -diam. thermal cond. detector (TCD) bead.
- Si micromachining was employed to fabricate the interface between the **sample injector** and the GC column, the GC column itself, and the dual-detector cavity. A novel processing technique was developed to sublime a homogeneous CuPc **stationary-phase** coating on the GC column walls. The complete MMGC system package is .apprx.4 in square and 100  $\mu\text{m}$  (2.5 mm) thick.
- TI **Silicon-micromachined gas chromatography** system used to separate and detect ammonia and nitrogen dioxide. Part I: Design, fabrication, and integration of the gas **chromatography** system
- AB A miniature gas **chromatog.** (GC) system was designed and developed using Si micromachining and integrated circuit (IC) processing techniques. The micromachined gas **chromatog.** (MMGC) system is composed of a miniature **sample injector** incorporating a 10- $\mu\text{m}$ -long **sample loop**; a 0.9-m-long, rectangular-shaped (300  $\mu\text{m}$  width and 10  $\mu\text{m}$  height) **capillary column** coated with a 0.2- $\mu\text{m}$ -thick Cu phthalocyanine (CuPc) **stationary phase**, and a dual-detector scheme based upon a CuPc-coated chemiresistor and a 125- $\mu\text{m}$ -diam. thermal cond. detector (TCD) bead.
- Si micromachining was employed to fabricate the interface between the **sample injector** and the GC column, the GC column itself, and the dual-detector cavity. A novel processing technique was developed to sublime a homogeneous CuPc **stationary-phase** coating on the GC column walls. The complete MMGC system package is .apprx.4 in square and 100  $\mu\text{m}$  (2.5 mm) thick.
- ST **silicon micromachined gas chromatograph**; ammonia detn  
**silicon micromachined gas chromatograph**; nitrogen dioxide detn  
**micromachined gas chromatograph**
- IT **Chromatographs, gas**  
(**silicon-micromachined gas chromatog.** system used to sep. and detect ammonia and nitrogen dioxide: design, fabrication, and integration of the gas **chromatog.** system)
- IT **Machining**  
(**micro-, silicon-micromachined gas chromatog.** system used to sep. and detect ammonia and nitrogen dioxide: design, fabrication, and integration of the gas **chromatog.** system)



IT 7664-41-7, Ammonia, analysis 10102-44-0, Nitrogen dioxide, analysis  
 RL: ANT (Analyte); ANST (Analytical study)  
 (silicon-micromachined gas **chromatog.** system used  
 to sep. and detect ammonia and nitrogen dioxide: design, fabrication,  
 and integration of the gas **chromatog.** system)

IT 7440-21-3, Silicon, uses  
 RL: DEV (Device component use); USES (Uses)  
 (silicon-micromachined gas **chromatog.** system used  
 to sep. and detect ammonia and nitrogen dioxide: design, fabrication,  
 and integration of the gas **chromatog.** system)

L58 ANSWER 12 OF 15 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 4  
 1994:234903 Document No. 120:234903 Design and performance evaluation of a  
 gas **chromatography** micromachined in a single crystal  
**silicon** substrate. Reston, R. R. (Sch. Eng., Air Force Inst.  
 Tech., Wright-Patterson AFB, OH, USA). Report, AFIT/DS/ENG/93M-01; Order  
 No. AD-A262594, 365 pp. Avail. NTIS From: Gov. Rep. Announce. Index (U.  
 S.) 1993, 93(14), Abstr. No. 340, 213 (English) 1993.

AB This investigation designed and developed a miniature gas  
**chromatog.** (GC) using **silicon** micromachining techniques.  
 The GC is composed of a miniature **sample** injector (10 .mu.L  
**sample** loop); a 0.9 m long, rectangular-shaped (300 .mu.m width  
 and 10 .mu.m height) **capillary column** coated with a  
 0.2 .mu.m thick copper phthalocyanine (CuPc) **stationary**  
**phase**; and a dual-detector scheme incorporating a CuPc-coated  
 chemiresistor and a 125 .mu.m diam. thermal cond. detector bead.  
 Micromachining was employed to fabricate the **sample** injector  
 interface, the GC column, and the dual-detector cavity. A novel  
 processing technique was developed to sublime the CuPc **stationary**  
**phase** coating on the GC column walls. The miniature GC system has  
 been used to sep. parts-per-million ammonia and nitrogen dioxide concns.  
 in less than 30 min (10 .mu.L **sample** injected at 40 psi). A  
 secondary discovery was the heat of adsorption of nitrogen dioxide (0.38  
 eV) on a polycryst. CuPc film (0.2 .mu.m thick). This research  
 demonstrated the utilization of a miniature GC to investigate the  
 adsorptive properties of thin films. Also, the time-domain performance  
 model of the miniature GC developed in this investigation will facilitate  
 the optimization of future miniature GC designs.

TI Design and performance evaluation of a gas **chromatography**  
 micromachined in a single crystal **silicon** substrate

AB This investigation designed and developed a miniature gas  
**chromatog.** (GC) using **silicon** micromachining techniques.  
 The GC is composed of a miniature **sample** injector (10 .mu.L  
**sample** loop); a 0.9 m long, rectangular-shaped (300 .mu.m width  
 and 10 .mu.m height) **capillary column** coated with a  
 0.2 .mu.m thick copper phthalocyanine (CuPc) **stationary**  
**phase**; and a dual-detector scheme incorporating a CuPc-coated  
 chemiresistor and a 125 .mu.m diam. thermal cond. detector bead.  
 Micromachining was employed to fabricate the **sample** injector  
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 demonstrated the utilization of a miniature GC to investigate the  
 adsorptive properties of thin films. Also, the time-domain performance  
 model of the miniature GC developed in this investigation will facilitate  
 the optimization of future miniature GC designs.

ST micromachined gas **chromatograph** design performance

- IT **Chromatographs, gas**  
(micromachined in single crystal **silicon** substrate, design and performance evaluation of)
- IT **Machining**  
(micro-, of gas **chromatographs** in single crystal **silicon** substrate)
- IT 7440-21-3, **Silicon**, uses  
RL: USES (Uses)  
(gas **chromatographs** micromachined in single crystal of, design and performance evaluation of)
- IT 7664-41-7, Ammonia, analysis 10102-44-0, Nitrogen dioxide, analysis  
RL: ANST (Analytical study)  
(sepn. of, on gas **chromatograph** micromachined in single crystal **silicon** substrate)

L58 ANSWER 13 OF 15 CAPLUS COPYRIGHT 2000 ACS

1989:445413 Document No. 111:45413 Pesticide residues in the drug Flos chamomillae. I. Determination of Potablan residues by gas **chromatography**. Buben, Ivan; Karmazin, M.; Odchazel, J. (Statni Ustav Kontr. Leciv, Prague, 10047, Czech.). Cesk. Farm., 38(2), 60-3 (Czech) 1989. CODEN: CKFRAY. ISSN: 0009-0530.

AB Residues of the pesticide Potablan (monalide being the active substance) were detd. in Flos Chamomillae and its dosage forms by means of gas **chromatog.** Extn. of monalide from the drug was carried out with n-heptane and the dry evapn. residue was dissolved in MeOH. The oil dosage form was extd. directly with MeOH. Methanolic exts. were then purified on a thin layer of SILUFOL UV 254 with the use of the system n-heptane-EtOAc (70:30). For an orientational detn. of the monalide content by means of gas **chromatog.**, a packed glass column 2.5 m .times. 3 mm with Diatoport S (80-10 mesh) soaked with 5% Versamid 900

was used. The temp. of the column was 210.degree. and the flow of the **mobile phase** (nitrogen) 40 mL/min. More exact detns. were carried out on a quartz **capillary column** WCOT 50 m .times. 0.23 mm, soaked with the **silicon** phase OV 101 with the temp. program 190.degree. for 23 min, a subsequent increase up to 230.degree. with the rate of 15 .degree.C/min and isothermal heating for 10 min at 230. The flow of the **mobile phase** (nitrogen) was 1 mL/min with the use of feed with SPLIT (1:5). An ANP detector was employed to increase sensitivity. The method made it possible to det. 0.05 ppm of monalide in the **samples**.

TI Pesticide residues in the drug Flos chamomillae. I. Determination of Potablan residues by gas **chromatography**

AB Residues of the pesticide Potablan (monalide being the active substance) were detd. in Flos Chamomillae and its dosage forms by means of gas **chromatog.** Extn. of monalide from the drug was carried out with n-heptane and the dry evapn. residue was dissolved in MeOH. The oil dosage form was extd. directly with MeOH. Methanolic exts. were then purified on a thin layer of SILUFOL UV 254 with the use of the system n-heptane-EtOAc (70:30). For an orientational detn. of the monalide content by means of gas **chromatog.**, a packed glass column 2.5 m .times. 3 mm with Diatoport S (80-10 mesh) soaked with 5% Versamid 900

was used. The temp. of the column was 210.degree. and the flow of the **mobile phase** (nitrogen) 40 mL/min. More exact detns. were carried out on a quartz **capillary column** WCOT 50 m .times. 0.23 mm, soaked with the **silicon** phase OV 101 with the temp. program 190.degree. for 23 min, a subsequent increase up to 230.degree. with the rate of 15 .degree.C/min and isothermal heating for 10 min at 230. The flow of the **mobile phase** (nitrogen) was 1 mL/min with the use of feed with SPLIT (1:5). An ANP

detector was employed to increase sensitivity. The method made it possible to det. 0.05 ppm of monalide in the **samples**.

ST Potablan residue chamomile gas **chromatog**

IT Plant analysis  
(Potablan detn. in chamomille by gas **chromatog**. in)

IT Matricaria  
(Potablan residues detn. in, by gas **chromatog**.)

IT 7287-36-7, Potablan  
RL: ANST (Analytical study)  
(detn. of residues of, in chamomile preps., by gas **chromatog** .)

L58 ANSWER 14 OF 15 CAPLUS COPYRIGHT 2000 ACS

1988:541832 Document No. 109:141832 Capillary **chromatography** device and method for its production. (Ottosensors Corp., USA). Austrian AT 385852 B 19880525, 7 pp. (German). CODEN: AUXXAK. APPLICATION: AT 1983-1689 19830509.

AB This device and method are described, where the device contains a measuring sensor which has a **capillary column** formed between a support layer and a protective layer with an inlet opening and an outlet opening for a **mobile phase** and/or a **sample**. A sol. substance, for example, a photosensitive resist, is applied on the substrate serving as the support layer, i.e., in a form which corresponds to the flow of the **capillary column** with a max. width of 100 .mu.m, preferably 1-20 .mu.m, and a max. height of 20 .mu.m, preferably 0.5-3 .mu.m as well as existing inlet, outlet, or detector chambers. A protective layer, in a thickness of 0.5-20 .mu.m, preferably 3 .mu.m, is applied, e.g., by vaporizing and/or sputtering and/or plasma enhanced chem. vapor deposition methods and/or electrolytically. The sol. substance is dissolved out through the inlet and outlet openings, whereby hollow space is produced by the bulging of the protective layer between the substrate and the protective layer of

the **capillary column** or possibly existing inlet, outlet, or detector chambers for the **mobile phase** and/or **sample**. In this way, the device is produced in large quantities with a complex structure by a simple method.

TI Capillary **chromatography** device and method for its production

AB This device and method are described, where the device contains a measuring sensor which has a **capillary column** formed between a support layer and a protective layer with an inlet opening and an outlet opening for a **mobile phase** and/or a **sample**. A sol. substance, for example, a photosensitive resist, is applied on the substrate serving as the support layer, i.e., in a form which corresponds to the flow of the **capillary column** with a max. width of 100 .mu.m, preferably 1-20 .mu.m, and a max. height of 20 .mu.m, preferably 0.5-3 .mu.m as well as existing inlet, outlet, or detector chambers. A protective layer, in a thickness of 0.5-20 .mu.m, preferably 3 .mu.m, is applied, e.g., by vaporizing and/or sputtering and/or plasma enhanced chem. vapor deposition methods and/or electrolytically. The sol. substance is dissolved out through the inlet and outlet openings, whereby hollow space is produced by the bulging of the protective layer between the substrate and the protective layer of

the **capillary column** or possibly existing inlet, outlet, or detector chambers for the **mobile phase** and/or **sample**. In this way, the device is produced in large quantities with a complex structure by a simple method.

ST capillary **chromatog** device prodn

IT **Chromatographs**, column and liquid  
(columns, capillary, prodn. of)

IT 1314-61-0, Tantalum pentoxide 7631-86-9, **Silicon** dioxide, uses  
and miscellaneous 11105-01-4 11126-22-0, **Silicon** oxide  
(unspecified) 12359-26-1, **Silicon** oxide (Si3O4) 13463-67-7,  
Titanium dioxide, uses and miscellaneous  
RL: ANST (Analytical study)  
(in capillary **chromatog.** device prodn., protective layer of)

L58 ANSWER 15 OF 15 NTIS COPYRIGHT 2000 NTIS

AN 1987(05):1342 NTIS

AB The requirements which would result in identifying the components of an  
automatic analytical system for the analysis of specific organic  
compounds

in the space station potable water supply are defined. The gas  
chromatographic system for such an analysis is limited to commercially  
available off-the-shelf hardware and includes the sample inlet, an  
ionization detector, capillary columns as well as computerized compound  
identification. The sampling system will be a special variation of the  
purge and trap Tenax mode using six-port valves and a 500 microliter  
water

sample. Capillary columns used for the separating of contaminants will be  
bonded phase fused silica with a silicone stationary phase. Two detectors  
can be used: photoionization and far ultraviolet, since they are

sensitive

and compatible with capillary columns. A computer system evaluation and  
program with the principle of compound identification based on the  
retention index is presented.

'IN' IS NOT A VALID FIELD CODE

L59 0 FILE MEDLINE

L60 17 FILE CAPLUS

L61 0 FILE BIOSIS

'IN' IS NOT A VALID FIELD CODE

L62 0 FILE EMBASE

L63 8 FILE WPIDS

'IN' IS NOT A VALID FIELD CODE

L64 0 FILE NTIS

'IN' IS NOT A VALID FIELD CODE

L65 0 FILE INSPEC

TOTAL FOR ALL FILES

L66 25 GILTON T?/AU, IN

=> dis his

(FILE 'HOME' ENTERED AT 13:18:13 ON 12 MAY 2000)

FILE 'REGISTRY' ENTERED AT 13:18:25 ON 12 MAY 2000

L1 4 S (NITROGEN OR HYDROGEN OR HELIUM OR ARGON)/CN

FILE 'MEDLINE, CAPLUS, BIOSIS, EMBASE, WPIDS, NTIS, INSPEC' ENTERED AT  
13:18:48 ON 12 MAY 2000

L2 94159 FILE MEDLINE

L3 213076 FILE CAPLUS

L4 93347 FILE BIOSIS

L5 76638 FILE EMBASE

L6 159773 FILE WPIDS

L7 23388 FILE NTIS

L8 56806 FILE INSPEC

TOTAL FOR ALL FILES

L9 717187 S (SEPARAT? OR CAPILLAR? COLUMN OR COLUMN CHROMATOGRAPH? OR  
FLO  
L10 5152 FILE MEDLINE  
L11 19403 FILE CAPLUS  
L12 2660 FILE BIOSIS  
L13 2054 FILE EMBASE  
L14 9118 FILE WPIDS  
L15 2465 FILE NTIS  
L16 4708 FILE INSPEC  
TOTAL FOR ALL FILES

L17 45560 S L9 AND (L1 OR NITROGEN OR HYDROGEN OR HELIUM OR ARGON)  
L18 500 FILE MEDLINE  
L19 293 FILE CAPLUS  
L20 90 FILE BIOSIS  
L21 106 FILE EMBASE  
L22 24 FILE WPIDS  
L23 18 FILE NTIS  
L24 13 FILE INSPEC  
TOTAL FOR ALL FILES

L25 1044 S (MOBILE OR STATIONARY) (W) PHASE AND L17  
L26 1 FILE MEDLINE  
L27 0 FILE CAPLUS  
L28 0 FILE BIOSIS  
L29 0 FILE EMBASE  
L30 0 FILE WPIDS  
L31 0 FILE NTIS  
L32 0 FILE INSPEC  
TOTAL FOR ALL FILES

L33 1 S (CAPTUR? OR SANDWICH? OR IMMOBIL?) (2A) (ANTIBOD? OR ANTIGEN?  
O  
L34 0 FILE MEDLINE  
L35 8 FILE CAPLUS  
L36 0 FILE BIOSIS  
L37 2 FILE EMBASE  
L38 1 FILE WPIDS  
L39 3 FILE NTIS  
L40 5 FILE INSPEC  
TOTAL FOR ALL FILES

L41 19 S "SAMPLE" AND (SEPARAT? APPARAT? OR CAPILLAR? COLUMN?) AND  
SIL  
L42 0 FILE MEDLINE  
L43 8 FILE CAPLUS  
L44 0 FILE BIOSIS  
L45 2 FILE EMBASE  
L46 1 FILE WPIDS  
L47 3 FILE NTIS  
L48 5 FILE INSPEC  
TOTAL FOR ALL FILES

L49 19 S L41 NOT L33  
L50 0 FILE MEDLINE  
L51 8 FILE CAPLUS  
L52 0 FILE BIOSIS  
L53 2 FILE EMBASE  
L54 1 FILE WPIDS  
L55 3 FILE NTIS  
L56 5 FILE INSPEC  
TOTAL FOR ALL FILES

L57 19 S L49 AND (ELECTRODE PROXIMAT? OR CHROMATOGRAPH? OR  
ELECTROPHOR  
L58 15 DUP REM L57 (4 DUPLICATES REMOVED)

L59 0 FILE MEDLINE  
 L60 17 FILE CAPLUS  
 L61 0 FILE BIOSIS  
 L62 0 FILE EMBASE  
 L63 8 FILE WPIDS  
 L64 0 FILE NTIS  
 L65 0 FILE INSPEC  
 TOTAL FOR ALL FILES  
 L66 25 S GILTON T?/AU,IN

=> s l66 not (l57 or l41 or l33)

L67 0 FILE MEDLINE  
 L68 17 FILE CAPLUS  
 L69 0 FILE BIOSIS  
 L70 0 FILE EMBASE  
 L71 8 FILE WPIDS  
 L72 0 FILE NTIS  
 L73 0 FILE INSPEC

TOTAL FOR ALL FILES  
 L74 25 L66 NOT (L57 OR L41 OR L33)

=> s l74 and capillar? column?

L75 0 FILE MEDLINE  
 L76 0 FILE CAPLUS  
 L77 0 FILE BIOSIS  
 L78 0 FILE EMBASE  
 L79 0 FILE WPIDS  
 L80 0 FILE NTIS  
 L81 0 FILE INSPEC

TOTAL FOR ALL FILES  
 L82 0 L74 AND CAPILLAR? COLUMN?

=> d l74 1-25 cbib abs

L74 ANSWER 1 OF 25 CAPLUS COPYRIGHT 2000 ACS  
 1999:720124 Document No. 131:316781 Fabrication of field emitters with  
 porous silicon. **Gilton, Terry L.** (Micron Technology, Inc.,  
 USA). U.S. US 5981303 A 19991109, 10 pp., Cont. of U.S. Ser. No.  
 307,960. (English). CODEN: USXXAM. APPLICATION: US 1997-895523  
 19970717. PRIORITY: US 1994-307960 19940916.

AB A process is provided for forming sharp asperities, useful as field  
 emitters. The process comprises: patterning and doping a silicon  
 substrate. The doped silicon substrate is anodized. The anodized area  
 is  
 then used for field emission tips. The process of the present invention  
 is also useful for low temp. sharpening of tips fabricated by other  
 methods. The tips are anodized, and then exposed to radiant energy, and  
 the resulting oxide is removed.

L74 ANSWER 2 OF 25 CAPLUS COPYRIGHT 2000 ACS  
 1998:190851 Document No. 128:277571 Optimization of ozonized DI rinse for  
 HF  
 last pre-gate clean. Li, L.; Lee, W.; **Gilton, T.**; Gonzalez, F.  
 (Micron Technology Inc., Boise, ID, 83707-0006, USA). Proc. -  
 Electrochem. Soc., 97-35 (Cleaning Technology in Semiconductor Device  
 Manufacturing), 272-279 (English) 1998. CODEN: PESODO. ISSN: 0161-6374.

Publisher: Electrochemical Society.

AB High vol. manufg. clean processes needed for pre-gate clean require efficient removal of metals and particulates. Although the HF last process has recently been seen as an attractive alternative to RCA cleans in the removal of metals, it has been demonstrated that particulate d. is higher. The optimal surface condition for a HF last pre-gate clean was detd. by applying an extended ozonized DI rinse step at different timed intervals to a regular 5 min DI rinse. The surface passivation was shown to be crit. for efficient particle removal and for its impact on the elec.

properties of the thin gate oxide films grown on such surface. The particle (LPD) data was correlated with the ozonized rinse time, contact angle, and XPS chem. bond compn. Metallic levels were detected on the VPD-TXRF technique and were shown to be at a low level. The HF last pre-gate clean process demonstrated that even a 4 ppm dissolved ozone level in the 120 s extended ozonized rinse time has a strong oxidizing effect and is adequate to almost completely passivate the silicon surface.

In this work, the post HF ozone (O3) concn. in the extended rinse step was

characterized to modify the surface passivation and thereby produce a manufg.-friendly, HF last pre-gate clean process.

L74 ANSWER 3 OF 25 CAPLUS COPYRIGHT 2000 ACS

1997:676341 Document No. 128:17615 Utilizing bath/wafer contamination correlation to validate a pre-gate cleaning strategy. **Gilton, Terry**; Higdon, Clarence; Copsey, Kate (Micron Technol., Inc., Boise, ID, 83707-0006, USA). Mater. Res. Soc. Symp. Proc., 477(Science and Technology of Semiconductor Surface Preparation), 433-438 (English) 1997. CODEN: MRSPDH. ISSN: 0272-9172. Publisher: Materials Research Society.

AB The correlation of contaminants in a process bath with contaminants on a silicon wafer prepd. in the bath is important information when developing a cleaning strategy. In this paper, we present such a correlation focused

on contaminants in dil. HF (1:100) and in SC1 (1:1:5 and 1:1:80 at 80.degree.C and 65.degree.C). We have limited the contamination levels to

between 0 and 150 ppb. We have also limited the contaminants studied to those that are most likely to be a problem (Fe, Al, Mg, Ca, Cu, Zn, and Na). The bath concns. are measured using ICPMS and the wafer surface concns. are measured using both VPD/TXRF and VPD/ICPMS. We demonstrate that Fe and Ca at the levels studied do not deposit from dil. HF, while

Cu deposits show a linear dependence on bath concn. We also demonstrate that in the SC1 bath, both concn. and temp. are important variables in the contamination of wafers for a given bath contamination level. Al and Zn contaminate wafers most strongly, with Al being the largest contributor

at the higher concn. of SC1 and Zn being the largest contributor in the lower

concn. Finally, we demonstrate that a dil. HF clean can remove everything deposited in a highly contaminated SC1 bath.

L74 ANSWER 4 OF 25 CAPLUS COPYRIGHT 2000 ACS

1997:97755 Document No. 126:179957 Plasma etching of semiconductor wafers. **Gilton, Terry L.** (Micron Technology, Inc., USA). U.S. US 5597444 A 19970128, 6 pp. (English). CODEN: USXXAM. APPLICATION: US 1996-593226 19960129.

AB A semiconductor etching method comprises exposing the wafer surface, in a

plasma etching app., to a RF plasma comprising a mixt. of a noble gas, a satd. or unsatd. reduced C compd. selected from the group consisting of C<sub>2</sub>H<sub>2</sub>, C<sub>6</sub>H<sub>6</sub>, graphite, or fullerene (C<sub>60</sub>), and a halogen compd. selected from the group consisting of F, Cl, Br, HCl, HF, HBr, SF<sub>6</sub>, and NF<sub>3</sub>.

L74 ANSWER 5 OF 25 CAPLUS COPYRIGHT 2000 ACS

1995:823418 Document No. 123:273680 Forming custom planar metal bonding pad connectors for a semiconductor die. **Gilton, Terry L.** (Micron Technology, Inc., USA). U.S. US 5445994 A 19950829, 8 pp. (English). CODEN: USXXAM. APPLICATION: US 1994-225651 19940411.

AB A method for forming custom planar connections to the bonding pads of a semiconductor die is provided. The method includes: depositing a passivation layer on the bonding pads; forming a patterning layer by depositing a dielec. material such as TEOS on the passivation layer; etching through the patterning layer and passivation layer to the bond pads using a 1st etch mask; etching a connector pattern in the patterning layer using a 2nd etch mask; depositing a metal layer over the patterning layer; and then planarizing the metal layer to an endpoint of the patterning layer to form planar metal connectors having a desired thickness.

L74 ANSWER 6 OF 25 CAPLUS COPYRIGHT 2000 ACS

1994:121350 Document No. 120:121350 Formation of self-limiting films by photoemission-induced vapor deposition. **Gilton, Terry L.** (Micron Technology, Inc., USA). U.S. US 5232749 A 19930803, 6 pp. Cont.-in-part of U.S. 5,129,991. (English). CODEN: USXXAM.

APPLICATION:

US 1992-914620 19920714. PRIORITY: US 1991-694011 19910430.

AB An adherent, self-limiting film of a predetd. thickness is formed on a substrate by irradiating the substrate with photons having energy greater than the photoemission threshold of the substrate material, causing secondary electrons to be emitted from the surface. The secondary electrons react with a precursor gas to form .gtoreq.1 reactive intermediate, which reacts to form a film on the substrate. The film is essentially transparent to the incident radiation, but has a greater photoemission threshold than the substrate, and thus does not emit secondary electrons in response to the photon radiation; the film is only partially transmissive of the secondary electrons emitted from the substrate surface, so as the film grows, fewer of the emitted electrons are able to escape from the film to react with the precursor gas. The film continues to grow until a thickness is reached at which no secondary electrons are able to escape, and the film formation reaction stops. The method is esp. useful in the manuf. of semiconductor and photovoltaic devices.

L74 ANSWER 7 OF 25 CAPLUS COPYRIGHT 2000 ACS

1993:31519 Document No. 118:31519 Metalizing integrated circuits with electrodeposited copper. **Gilton, Terry L.**; Tuttle, Mark E.; Cathey, David A. (Micron Technology, Inc., USA). U.S. US 5151168 A 19920929, 11 pp. (English). CODEN: USXXAM. APPLICATION: US 1990-587302 19900924.

AB A conductive barrier layer is formed by sputtering or CVD on a dielec. layer having contact openings on an integrated circuit chip; a dielec. or photoresist mask comprising a reverse image of the desired metalization pattern is formed on the barrier layer; the chip is immersed in an electrolyte at pH 13.5 contg. Cu complexed with EDTA; Cu is deposited to the desired thickness on the barrier layer where it is not covered by the mask; the chip is removed from the electrolyte, and the mask is stripped; and the portions of the barrier layer that are exposed by removal of the mask are removed by a wet or dry etch. At c.ds. <1 mA/cm<sup>2</sup>, contact or

via



openings are filled to a uniform thickness independently of the depth of the opening. A corrosion-resistant metal layer may be electroplated on the Cu before the barrier layer is removed. This process is considerably less complex than other metalization processes using electrodeposition, and provides excellent step coverage for sub-.mu.m contact openings.

L74 ANSWER 8 OF 25 CAPLUS COPYRIGHT 2000 ACS

1992:582969 Document No. 117:182969 Photoelectron-induced selective etch process. **Gilton, Terry L.** (Micron Technology, Inc., USA). U.S. US 5129991 A 19920714, 9 pp. (English). CODEN: USXXAM. APPLICATION:

US

1991-694011 19910430.

AB The relative photoemission threshold properties of conductive materials are used as a basis for selectively etching conductive materials in the presence of other conductive materials. An irradiation beam of pre-selected wavelength is used to generate photoemitted electrons locally which in turn create reactive etch fragments in localized regions adjacent to the electron source. These localized fragments react with the material to be etched to form volatile reaction products which are removed from the chamber in which these reactions take place. Various configurations for the treatment of conductive materials are described. In 1 embodiment,

the

irradiation beam is impinged upon the substrate at an incident angle to

create

nonorthogonal surfaces.

L74 ANSWER 9 OF 25 CAPLUS COPYRIGHT 2000 ACS

1992:173371 Document No. 116:173371 Probing femtosecond solvation dynamics at the condensed phase-vacuum interface. Kwini, Mlungisi; Iedema, Martin J.; Cowin, James P.; **Gilton, Terry L.** (Pac. Northwest Lab., Richland, WA, 99352, USA). J. Phys. Chem., 96(7), 2795-800 (English) 1992. CODEN: JPCHAX. ISSN: 0022-3654.

AB The photoelectron-induced dissociation of CH<sub>3</sub>Cl adsorbed on top of a multilayer deposit ejects Me radicals into the gas phase. The kinetic energies of these methyls vary with the identity of the underlying multilayer (H<sub>2</sub>O, hexane, CH<sub>3</sub>Cl), from 0.44 to 0.7 eV at the peak, and are much higher than seen for the gas-phase dissociative electron attachment to this mol. The additional energy is understood in terms of the effects of the prompt solvation (<40 fs) on the anionic repulsive curve and suggests a powerful approach to probing it.

L74 ANSWER 10 OF 25 CAPLUS COPYRIGHT 2000 ACS

1991:217837 Document No. 114:217837 The role of substrate photoelectrons in the ultraviolet photochemistry of physisorbed methyl halides.

**Gilton, Terry L.** (Univ. California, Santa Barbara, CA, USA). 171 pp. Avail. Univ. Microfilms Int., Order No. DA9034326 From: Diss.

Abstr.

Int. B 1991, 51(7), 3393 (English) 1990.

AB Unavailable

L74 ANSWER 11 OF 25 CAPLUS COPYRIGHT 2000 ACS

1991:33650 Document No. 114:33650 Intense surface photoemission: space charge effects and self-acceleration. **Gilton, Terry L.**; Cowin, James P.; Kubiak, Glenn D.; Hamza, Alex V. (Micron Technol. Inc., Boise, ID, 83706, USA). J. Appl. Phys., 68(9), 4802-10 (English) 1990. CODEN: JAPIAU. ISSN: 0021-8979.

AB A review with 14 refs.

L74 ANSWER 12 OF 25 CAPLUS COPYRIGHT 2000 ACS

1990:148814 Document No. 112:148814 Perturbations, inhibition, and promotion

of ultraviolet surface photochemistry: bromomethane on brominated nickel(111). Marsh, E. P.; Tabares, F. L.; Schneider, M. R.; **Gilton, T. L.**; Meier, W.; Cowin, J. P. (Chem. Dep., Univ. California, Santa Barbara, CA, 93106, USA). J. Chem. Phys., 92(3), 2004-14 (English) 1990. CODEN: JCPSA6. ISSN: 0021-9606.

- AB The inhibition and perturbations of surface photochem. due to the coupling of the excited state to the surface are discussed as it pertains to CH<sub>3</sub>Br adsorbed on Ni. Photofragmentation of CH<sub>3</sub>Br was obsd. on a brominated Ni(111) surface, with the fragmentation process being strongly perturbed at low coverages. The perturbations are due to charge-transfer processes. Direct photofragmentation was obsd. as well as a surface specific dissociative electron attachment channel. Cross section values are reported for fragmentation at 193 and 248 nm.

L74 ANSWER 13 OF 25 CAPLUS COPYRIGHT 2000 ACS

1989:643968 Document No. 111:243968 UV surface photochemistry and hot electron transfer. Cowin, James P.; Marsh, Eugene P.; Meier, Wolfgang; **Gilton, Terry L.**; Schneider, Mark R. (Chem. Dep., Univ. California, Santa Barbara, CA, 93106, USA). Proc. SPIE-Int. Soc. Opt. Eng., 1056(Photochem. Thin Films), 147-56 (English) 1989. CODEN: PSISDG. ISSN: 0277-786X.

- AB Two different photolytic mechanisms were identified for CH<sub>3</sub>Cl on Ni(111). Direct photolysis and electron-induced fragmentation was obsd. in time of flight studies using 193 nm radiation. At 248 nm only the electron induced channel was obsd. Both mechanisms were strongly inhibited in the first 2 monolayers, due to electron transfer occurring on a 1 to 5 fs time scale. The electron induced process was surface specific, occurring within a limited adsorbate thickness detd. by the penetration depth of the excited substrate electrons into the adsorbate. Cross sections for the total photolytic removal of parent mols. are reported as a function of coverage.

L74 ANSWER 14 OF 25 CAPLUS COPYRIGHT 2000 ACS

1989:543869 Document No. 111:143869 Electron transmission through layers of water and xenon in the ultrahigh vacuum photoreduction of chloromethane on nickel(111). **Gilton, Terry L.**; Dehnbostel, Claus P.; Cowin, James P. (Dep. Chem., Univ. California, Santa Barbara, CA, 93106, USA). J. Chem. Phys., 91(3), 1937-8 (English) 1989. CODEN: JCPSA6. ISSN: 0021-9606.

- AB A method for monitoring the transmission of substrate electrons through dielec. layers utilizes the electron-mediated fragmentation of CH<sub>3</sub>Cl as a "detector". The UV photon-induced fragmentation of CH<sub>3</sub>Cl adsorbed on Ni(111) involves 2 distinct processes: direct repulsive state photofragmentation and electron-mediated fragmentation. The latter process is easily isolated, and by monitoring the CH<sub>3</sub> fragment yield, the transmission probability of very low energy electrons through H<sub>2</sub>O and Xe spacer layers is measured. These spacers allow a comparison between strong and weakly-scattering media (H<sub>2</sub>O and Xe, resp.).

L74 ANSWER 15 OF 25 CAPLUS COPYRIGHT 2000 ACS

1989:438729 Document No. 111:38729 Electron-transfer-mediated and direct surface photochemistry: chloromethane on nickel(111). Marsh, Eugene P.; **Gilton, Terry L.**; Meier, Wolfgang; Schneider, Mark R.; Cowin, James P. (Chem. Dep., Univ. California, Santa Barbara, CA, 93106, USA). Phys. Rev. Lett., 61(23), 2725-8 (English) 1988. CODEN: PRLTAO. ISSN: 0031-9007.

AB Direct photolysis and electron-induced fragmentation of CH<sub>3</sub>Cl on a Ni(111) surface was obsd. in time-of-flight studies using 193-nm radiation. With 248-nm radiation, only electron-induced fragmentation was obsd. With 351-nm radiation no fragments were obsd. The electron-induced process was surface specific, occurring within a limited adsorbate thickness detd. by the penetration depth of the excited substrate electrons into the adsorbate. Cross sections are reported as a function of coverage.

L74 ANSWER 16 OF 25 CAPLUS COPYRIGHT 2000 ACS  
1988:464087 Document No. 109:64087 Photofragmentation of bromomethane on brominated nickel surface (Br/Ni(111)): cross section and competitive processes. Marsh, E. P.; Schneider, M. R.; **Gilton, T. L.**; Tabares, F. L.; Meier, W.; Cowin, J. P. (Chem. Dep., Univ. California, Santa Barbara, CA, 93106, USA). Phys. Rev. Lett., 60(24), 2551-4 (English) 1988. CODEN: PRLTAO. ISSN: 0031-9007.

AB Photolysis of CH<sub>3</sub>Br on a brominated Ni(111) surface was obsd. Cross-section values are reported for 0.5-, 1-, 2-, 3-, and 10-monolayer coverages. The obsd. cross sections and photofragment times of flight indicate that complete quenching of the photolysis does not take place and that the photodynamics is strongly perturbed.

L74 ANSWER 17 OF 25 CAPLUS COPYRIGHT 2000 ACS  
1986:226559 Document No. 104:226559 Improved internal bond strength of high-density particle boards containing formaldehyde-free whey-based resins on addition of phthalic anhydride. Viswanathan, Tito; **Gilton, Terry** (Dep. Chem., Univ. Arkansas, Little Rock, AR, 72204, USA). Ind. Eng. Chem. Prod. Res. Dev., 25(2), 313-15 (English) 1986. CODEN: IEPR6. ISSN: 0196-4321.

AB Addn. of phthalic anhydride (I) [85-44-9] to several whey-based resins significantly increased the cohesion of high-d. particleboards made from the resins. Of 4 different samples prepd., the resin obtained with whey permeate-NH<sub>4</sub>NO<sub>3</sub>-Cu(II) performed best with addn. of I. The whey-based resins with I when compared to urea-HCHO resin and HCHO-PhOH resin performed at least as well in terms of cohesion and swelling in water. The final curing of the resin in the particleboards could be due to the crosslinking of I with high-mol.-wt. Maillard polymers among others.

L74 ANSWER 18 OF 25 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD  
AN 2000-022080 [02] WPIDS

AB US 5981303 A UPAB: 20000112  
NOVELTY - A method for fabricating field emitters comprises anodising doped isolated exposed regions of a polycrystalline or amorphous silicon substrate defining regions of field emitter tips that are isolated from adjacent tips by relatively undoped silicon regions.

DETAILED DESCRIPTION - A method (I) for fabricating field emitters comprises patterning a polycrystalline or amorphous silicon substrate to define isolated exposed regions, doping said regions then anodising said regions to define regions of field emitter tips that are isolated from adjacent tips by relatively undoped silicon regions.

INDEPENDENT CLAIMS are also included for the following: a) a process for forming sharp asperities, useful as field emitter as (I) b) a method for fabricating isolated arrays of emitter tips as (I).

USE - Field emitters are used in flat panel displays.

ADVANTAGE - Sharp emitter tips are provided that increase display clarity. The process occurs at room temperature. The anodisation provides a surface that is easily oxidized by ultraviolet light at low temperatures  
i.e. 20-100 deg. C.

DESCRIPTION OF DRAWING(S) - The drawing shows porous silicon having

a

sharp tip structure following anodisation.

porous silicon 31

sharp tips 33

mask 32

Dwg.3B/5

L74 ANSWER 19 OF 25 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD

AN 1999-094734 [08] WPIDS

AB US 5853492 A UPAB: 19990224

A wet chemical process for treating emitter tips formed on a substrate of an emitter for use in a field emission display comprises applying a soln. to the emitter tips to remove native oxides. Pref. the soln. is one of

an

aqueous soln. of hydrofluoric acid, sulphuric acid, hydrochloric acid, ammonium sulphate, or ammonium hydroxide.

USE - A method for treating emitter tips as used in electron generating devices.

ADVANTAGE - Treated emitter tips have a lower work function and reduced burn time.

Dwg.1/2

L74 ANSWER 20 OF 25 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD

AN 1997-108239 [10] WPIDS

AB US 5597444 A UPAB: 19970307

Plasma etching semiconductor wafers in a plasma etching appts. comprises exposing the wafer to a plasma comprising at least a mixt. of a reduced carbon cpd. and a non-CFC halogen cpd..

USE - Plasma dry etching process for semiconductor wafers.

ADVANTAGE - Utilises non-CFC cpds. to provide the necessary reactive species for the etch process; improved toxicological and environmental profile.

Dwg.0/2

L74 ANSWER 21 OF 25 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD

AN 1995-310914 [40] WPIDS

AB US 5445994 A UPAB: 19951011

Forming planar metal connectors to bonding pads, electrically connected ICs on a semiconductor die, involves (a) depositing a passivation layer and then a patterning layer of thickness 't' over the die and bonding pads; (b) etching the layers to form a pattern of openings to the bonding pads; (c) etching the patterning layer to form a mould for the

connectors,

the mould having openings aligned with the openings to the pads; (d) depositing a metal layer over the patterning layer and into the mould and openings to the pads; and (e) planarising the metal layer down to the patterning layer to form connectors in a desired pattern and of thickness 't'.

Also claimed are similar methods, in which the patterning layer consists of dielectric material and first and second etch masks are used in steps (b) and (c).

ADVANTAGE - Completely planar connectors of any metal can be formed in a pattern which may be customised to match different bonding pad and lead finger configurations, by a simple, low cost method which is adaptable to large scale semiconductor mfr.

Dwg.4B/5

L74 ANSWER 22 OF 25 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD

AN 1993-257863 [32] WPIDS

CR 1992-258852 [31]

AB US 5232749 A UPAB: 19931118

A process for forming a film on a substrate surface comprising a) providing a substrate with outer surface having photoemission threshold above which electrons are emitted; b) providing a reactant near the substrate surface; c) irradiating this surface with radiation of energy exceeding the surfaces photoemission threshold, thereby emitting electrons

from this; d) reacting these electrons with the reactant to form a reactive intermediate; e) reacting the intermediate to form a film over the substrate surface, the film passes radiation to the surface and is attenuative of the emitted electrons; f) forming the film to a thickness

at which the electrons are attenuated by the film.

USE/ADVANTAGE - A process for depositing self-limiting films on the surface of a substrate such as in the manufacture of semiconductor devices, integrated circuits or photovoltaic devices.

Dwg.1/2

L74 ANSWER 23 OF 25 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD

AN 1993-085476 [11] WPIDS

AB US 5188723 A UPAB: 19930924

A material having a redn. potential is selectively electrodeposited upon a

surface whilst inhibiting or nullifying deposition of the material or to a second surface adjacent to the first, by:- (a) Putting the first and second surface at differing potentials and (b) Electrodepositing the material successively over both first and second surface, with modulated voltage having positive and negative duty cycles, adjusted to remove during the negative duty cycle, any material deposited on the second surface during the positive cycle.

USE/ADVANTAGE - The method is useful in the production of integrated circuit or similar, and particularly in depositing a patterned layer of conductive material such as copper to form the circuit. By using a bi-polar modulated voltage in the electroplating process such that two layers of material are deposited during the positive duty cycle and the material of one layer is removed during the negative cycle, the circuit lines can be formed in a more precise and compact mode, than by conventional photolithographic technique.

8/9

L74 ANSWER 24 OF 25 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD

AN 1992-348524 [42] WPIDS

AB US 5151168 A UPAB: 19931115

A process for metallising an integrated circuit chip with Cu, comprising: a) forming electrical contact openings in a dielectric layer on the chip, b) depositing a conductive barrier layer on the surface, c) creating, on top of the barrier layer, a dielectric material mask which is a reverse image of the desired metallisation, d) submersing the chip in an electrolytic bath contg. Cu ions complexed with EDTA, to deposit metallic Cu to a desired thickness on portions of the barrier layer not covered by the mask, e) stripping the dielectric mask, f) removing the portions of barrier layer exposed by removal of the dielectric material mask.

USE/ADVANTAGE - The process is a relatively safe, simplified, Cu deposition for metallisation of semiconductor circuitry. Excellent step coverage and adhesion are obtd..

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Dwg.7/9

L74 ANSWER 25 OF 25 WPIDS COPYRIGHT 2000 DERWENT INFORMATION LTD

AN 1992-258852 [31] WPIDS

CR 1993-257863 [32]

AB US 5129991 A UPAB: 19931118

A photoelectron-induced selective etching method for a substrate device comprises placing the device, which has a transparent surface layer (4)

to

be selectively etched and beneath which are a conductive region (8) and a region adjacent to this of higher photoemission threshold (6), into a chamber with an etch gas which adsorbs onto the device and is dissociable into reactive fragments which form a volatile prod. with the surface.

Radiation of wavelength exceeding (sic.) the photoemission threshold of the conductive region impinges on the device and generates photo-excited electrons which react with the adsorbed gas to form etch fragments. The radiation wavelength is less (sic) than the threshold of the other region (6). The volatile species formed during etching are removed to expose the conductive region beneath the surface layer only. Also claimed are: a method as above in which the device has many surface conductive regions which are again selectively exposed as above; method as above where the device has at least two conductive regions of different threshold comprising capping the region of lower threshold using an etch gas which forms reactive fragments with photoelectrons which themselves form non-volatile prods. with the region to be capped, and impinging radiation which forms electrons only at the surface to be capped by a photon-opaque thin film. A second etch gas replaces the first and, with a second radiation beam, forms species which etch the uncapped conductive region

to

give removable volatile; and a process as above which creates a non-orthogonal surface comprising impinging the radiation beam at a non-orthogonal incidence angle so that the adjacent region forms a shadow on the conductive region to be etched, with the adjacent region being inert to the radiation. The photoelectrons again react with the adsorbed etchant to give fragments which form volatile, removable species with the conductive region surface.

USE/ADVANTAGE - Process for photoelectron-induced selective etching (claimed) are provided which are useful in microelectronic fabrication. The molecular level interaction provides great etching specificity in higher yields without the need to mask adjoining regions. Also different layers of a device may be processed simultaneously and there are fewer steps.

1/3

Dwg.1/3

=> log y

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